

Drawing I

STEP 1

You will be connecting wires to the grounding lug that attaches a terminal strip to the chassis. Figure 11 shows the exact location of this point. When connections are to be made to PB-1, you will want to refer back to Drawing H for the exact pin location. There is never more than one wire going to any pin on PB-1. If you find yourself connecting a second wire to one of the pins, check back to find your error. When connecting cables to PB-1, position them so they come up between TS-5 and the back of the switch.

I-1. Connect the insulated end of a red/white cable #21 to Pin 2, bottom, VR-1. Connect the bare wire at this end to the mounting lug that connects TS-1 to the chassis. Clip off the bare wire at the opposite end. Connect the insulated wire to Pin 6, PB-1 (solder 1).

I-2. Connect the insulated end of red cable #22 to Pin 5 top, VR-1. Connect the bare wire at this end to the same grounding point used in I-1. Clip off the bare wire at the opposite end. Connect the insulated wire to Pin 9, PB-1 (solder 1).

I-3. Connect the insulated wire at one end of a red/white cable #23 to Pin 1, TS-1. Connect the bare wire at this end to the same point as in I-1. Clip off the bare wire at the opposite end. Connect the insulated wire at that end to Pin 5, PB-1 (solder 1).

I-4. Connect the insulated wire at one end of red cable #24 to Pin 2, TS-1. Connect the bare wire to the same point as in I-1 (solder 4). * Clip off the bare wire at the opposite end. Connect the insulated wire at that end to Pin 8, PB-1 (solder 1).

I-5. Connect the insulated wire at one end of a red/white cable #25 to Pin 4, (top) VR-2. Connect the bare wire at this end to the grounding lug on TS-2. Clip off the bare wire at the other end. Connect the insulated wire at that end to Pin 14, PB-1 (solder 1).

I-6. Connect the insulated wire at one end of a red/white #26 cable to Pin 6, (top), VR-2. Connect the bare wire at this end to the same point as in I-5. Clip off the bare wire at the opposite end. Connect the insulated wire to Pin 26, PB-1 (solder 1).

I-7. Connect the insulated wire at one end of a red cable #27 to Pin 1, TS-2. Connect the bare wire at this end to the same terminal as in I-5 (solder 3). Clip off the bare wire at the opposite end. Connect the insulated wire to Pin 29, PB-1 (solder 1).

I-8. Connect red cable #28 to Pin 1, TS-4. Connect the bare wire at this end to the grounding lug on TS-4 (solder 1). Clip off the bare wire at the opposite end. Connect the insulated wire at the opposite end to Pin 17, PB-1 (solder 1).

I-9. Connect the insulated wire at one end of red cable #29 to Pin 24, PB-1 (solder 1). Do not connect the bare wire at this end now.

*If you can't fit all four wires through the hole in the lug, wrap the wires around the one or two that do fit in, and solder securely.

Connect the insulated wire at the other end to Pin 2, S-2 (solder 3) and the bare wire to Pin 1, S-2 (solder 2).

I-10. Connect the insulated wire at one end of red/white cable #30 to Pin 21, PB-1 (solder 1). Do not connect the bare wire at this time. Connect the insulated wire at the other end to Pin 9, S-2 (solder 2) and the bare wire to Pin 8, S-2 (solder 2).

I-11. Connect a 10" red/white wire from Pin 11, PB-1 (solder 1) to Pin 6, (top) VR-4.

I-12. Connect a 10" red wire from Pin 4 (top) VR-4 to Pin 32, PB-1 (solder 1).

I-13. Connect a 13" red/white wire from Pin 22, PB-1 (solder 1) to Pin 9, BJ-2 (solder 1).

I-14. Connect a 10½" red wire from Pin 25, PB-1 (solder) to Pin 9, BJ-1 (solder 1).

I-15. Connect the insulated wire at one end of red cable #31 to Pin 23, PB-1 (solder 1). Take the bare wire and connect it to the bare wire on the end of cable #29. (Solder these two wires together and clip off the excess.)

I-16. Connect the insulated wire at one end of red/white cable #32 to Pin 20, PB-1 (solder 1). Take the bare wire and connect it to the bare wire on cable #30. Solder these two wires together and clip off the excess.

I-17. Clip off the bare wire at one end of red/white cable #33. Connect the insulated wire at this end to Pin 16, PB-1 (solder 1). Connect the insulated wire at the other end to Pin 4, BJ-2, and the bare wire to Pin 5, BJ-2.

I-18. Cut off the bare wire at one end of red/white cable #34. Connect the insulated wire at this end to Pin 31, PB-1 (solder 1). Connect the insulated wire at the other end to Pin 3, BJ-2, and the bare wire to Pin 5, BJ-2 (solder 2).

I-19. Cut off the bare wire at one end of red cable #35. Connect the insulated wire at this end to Pin 19, PB-1 (solder 1). Connect the insulated wire at the other end to Pin 3, BJ-1, and the bare wire to Pin 5, BJ-1.

I-20. Cut off the bare wire at one end of red cable #36. Connect the insulated wire at this end to Pin 34, PB-1 (solder 1). Connect the insulated wire at the other end to Pin 4, BJ-1 and the bare wire to Pin 5, BJ-1 (solder 2).

I-21. Take the 11½" piece of large black shielded cable and slide two 14" heavy black wires through it. At one end connect one wire to Pin 1, PB-1 (solder 1) and the other to Pin 2, PB-1 (solder 1).

I-22. Connect the red insulated wire at one end of cable #37 to Pin 1, TS-3. Connect the black insulated wire at this end to Pin 2, TS-3. Connect the bare wire at this end to the ground lug on TS-3 (solder 1). Do not connect the other end now.

STEP J

Don't be afraid to move aside the various cables that were connected in previous steps. Keep the leads on the resistors and capacitors as short as possible. It is not unusual to clip leads as short as $\frac{1}{2}$ " in some cases. Don't clip the leads, however, until you have carefully measured what you will require. The drawings should give you a good indication.

J-1. Connect one of the bare wires coming from the pilot light to Pin 1, TS-3 (solder 2). Connect the other one to Pin 2, TS-3 (solder 2).

J-2. Connect a 16" red wire from Pin 2 (bottom), VR-3 (solder 1) to Pin 3, BJ-1 (solder 2).

J-3. Connect 16" red wire from Pin 3 (bottom), VR-3 (solder 1) to Pin 4, BJ-1 (solder 2).

J-4. Connect a 19" red/white wire from Pin 4 (top), VR-3 (solder 1) to Pin 4, BJ-2 (solder 2).

J-5. Connect a 19" red/white wire from Pin 5 (top), VR-3 (solder 1) to Pin 3, BJ-2 (solder 2).

From this point on, you will begin to connect resistors, capacitors, and diodes to the control center. The leads on these components are generally supplied far longer than needed. Trim off the excess. Just leave enough wire at the ends to permit a simple mechanical joint. The resistors will be found in envelope #14 and the capacitors in #15. To facilitate locating the correct value, the resistors will be specified both as to value and as to the three identifying color bands (the fourth color band found on many resistors indicates tolerance and is not important for your purpose). The capacitor values are always printed right on the components themselves. For example: a CPM -.1 will have the .1 MFD printed right on the body of the capacitor (along with the voltage rating). Use spaghetti whenever you feel a short circuit may occur.

J-6. Connect a 100K resistor (brown, black, yellow) from pin 1, TS-1 (solder 2) to Pin 2 (bottom) VR-1 (solder 2).

J-7. Connect a 100K resistor (brown, black, yellow) from Pin 2, TS-1 (solder 2) to Pin 5 (top), VR-1 (solder 2).

J-8. Connect one end of a 5.6K resistor (green, blue, red) to Pin 1, TS-2. Pass the other end through the hole in Pin 2,* TS-2 and connect it to Pin 2 (bottom), VR-2 (solder 1).

*A wire passing through a pin counts as two connections when the pin is soldered.

J-9. Connect a (capacitor) CPM .1 from Pin 2, TS-2 to Pin 1 (bottom) VR-2. (Use spaghetti.)

J-10. Connect a CPM .1 from Pin 2, TS-2 to Pin 3 (bottom) VR-2.

J-11. Connect a 4.7K resistor (yellow, purple, red) from Pin 1, (bottom) VR-2 (solder 2) to Pin 4 (top) VR-2.

J-12. Connect a 4.7K resistor (yellow, purple, red) from Pin 3 (bottom) VR-2, to Pin 6 (top) VR-2 (solder 2).

J-13. Connect an 18K resistor (brown, grey, orange) from Pin 4 (top), VR-2 to Pin 5 (top) VR-2.

J-14. Connect a 27K resistor (red, purple, orange) from Pin 1, TS-2 to Pin 4 (top) VR-2 (solder 4).

J-15. Connect an 18K resistor (brown, grey, orange) from Pin 2, TS-2 (solder 5) to Pin 3 (bottom) VR-2 (solder 3).

J-16. Connect a CMS-3900 capacitor from Pin 1, TS-2 (solder 4) to Pin 5 (top) VR-2 (solder 2).

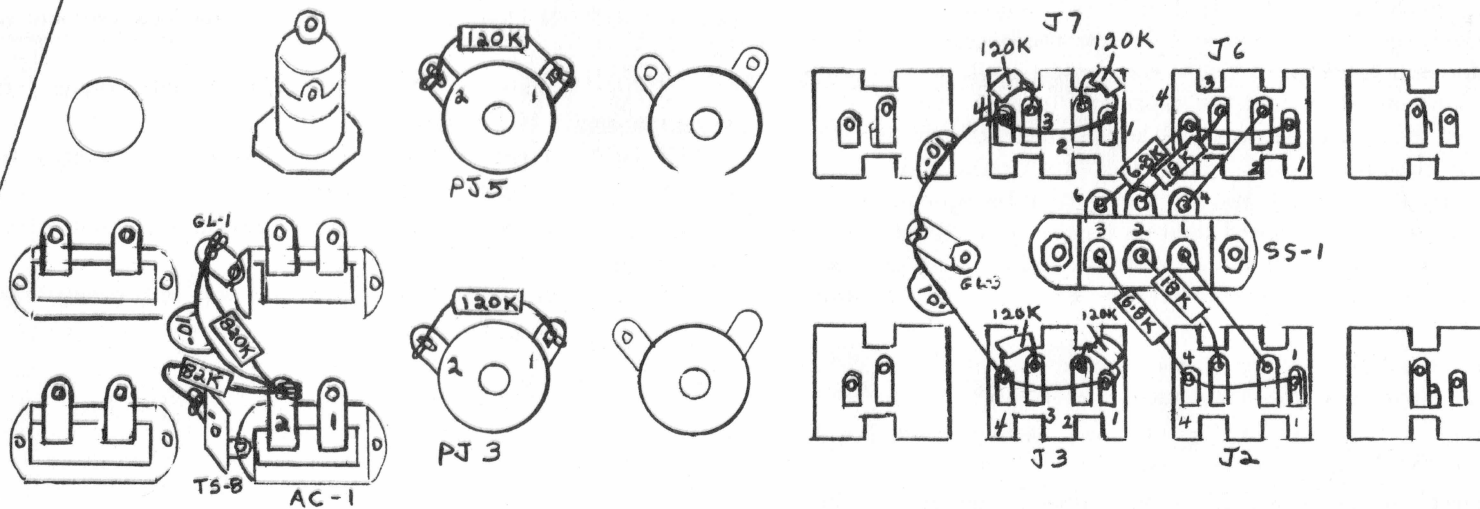
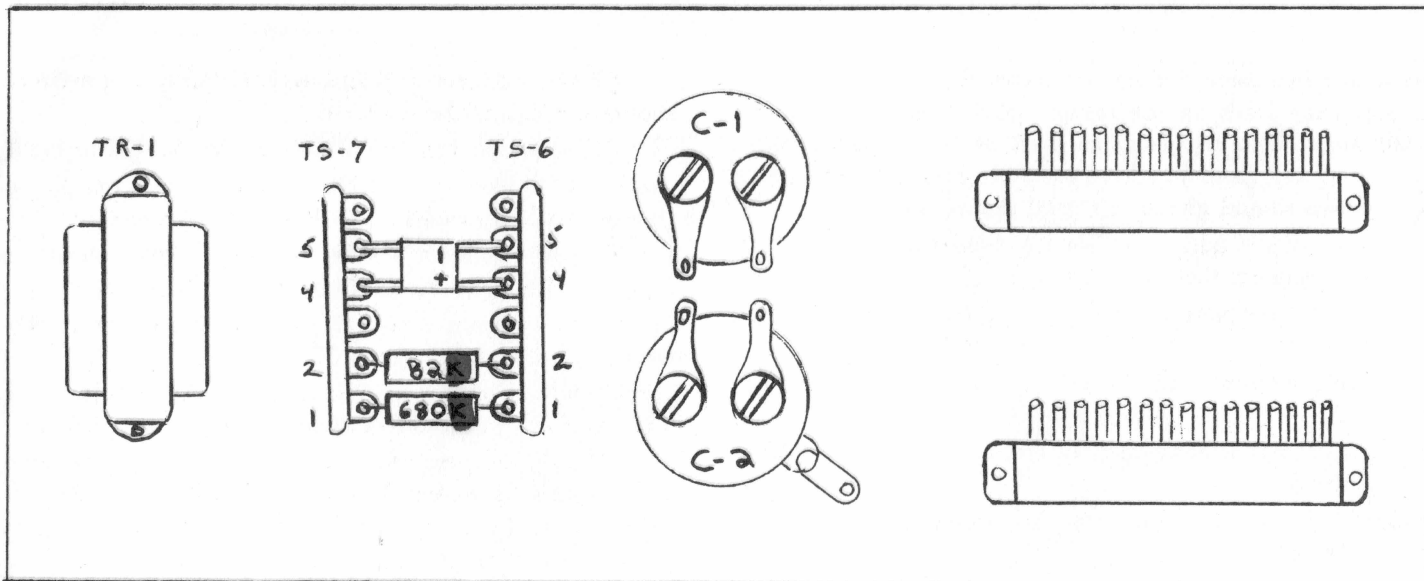
J-17. Now repeat all operations from J-8 through J-16 only connect to VR-4 and TS-4. Same components, same location, same pin numbers as shown.

J-18. Connect an 18K resistor (brown, grey, orange) from Pin 1, TS-5 (solder 2) to Pin 2, TS-5.

J-19. Connect a 12K resistor (brown, red, orange) from Pin 2, TS-5 (solder 3) to Pin 3, TS-5 (solder 2).

J-20. Connect an 18K resistor (brown, grey, orange) from Pin 4, TS-5 (solder 2) to Pin 5, TS-5.

J-21. Connect a 12K resistor (brown, red, orange) from Pin 5, (solder 3) to Pin 6, TS-5 (solder 2).



Drawing K

STEP K

K-1. For this step use a paper clip or a bobby pin as a heatsink as described in the Section on "How to Solder" and in Figure 3. Take the small diode found in envelope #15. Observe the location of the small "+" and "-" signs. See fig. 12. Connect lead no. 1 to Pin 5, TS-6 (solder 2). Connect lead no. 2 to Pin 4, TS-6 (solder 2). Lead no. 3 to Pin 4, TS-7 (solder 2) and 4 to Pin 5, TS-7 (solder 2).

K-2. Connect a large 82 OHM resistor (grey, red, black) from Pin 2, TS-7 (solder 2) to Pin 2, TS-6 (solder 2).

K-3. Connect a 680 OHM large resistor (blue, grey, brown) from Pin 1, TS-7 (solder 2) to Pin 1, TS-6 (solder 3).

K-4. Connect an 820K resistor (grey, red, yellow) from Pin 2 AC-1 to GL-1.

K-5. Connect a CC-01M capacitor from Pin 2, AC-1 to GL-1.

K-6. Connect an 82K resistor (grey, red, orange) from Pin 2, AC-1 (solder 5) to Pin 1, TS-8.

K-7. Connect a 6.8K resistor (blue, grey, red) from Pin 4, J-2 to Pin 3, SS-1 (solder 1).

K-8. Connect a 6.8K resistor (blue, grey, red) from Pin 4, J-6 to Pin 6, SS-1 (solder 1).

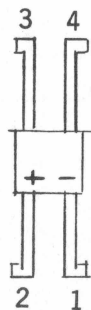


Fig. 12

K-9. Connect an 18K resistor (brown, grey, orange) from Pin 3, J-2 (solder 1) to Pin 2, SS-1.

K-10. Connect an 18K resistor (brown, grey, orange) from Pin 3, J6 (solder 1) to Pin 5, SS-1.

K-11. Connect a CD (ceramic disc capacitor) .01M from Pin 4, J3 to GL-3.

K-12. Connect a 120K resistor (brown, red, yellow) from Pin 1, J3 to Pin 2, J-3.

K-13. Connect a 120K resistor (brown, red, yellow) from Pin 3, J-3 to Pin 4, J-3.

K-14. Connect a 120K resistor (brown, red, yellow) from Pin 1, J-7 to Pin 2, J-7.

K-15. Connect a 120K resistor (brown, red, yellow) from Pin 3, J-7 to Pin 4, J-7.

K-16. Connect a 120K resistor (brown, red, yellow) from Pin 1, PJ-3 to Pin 2, PJ-3.

K-17. Connect a 120K resistor (brown, red, yellow) from Pin 1, PJ-5 to Pin 2, PJ-5.

K-18. Connect a CD .01M from Pin 4, J-7 to GL-3 (solder 2).

K-19. Connect 1 $\frac{3}{4}$ " black wire from Pin 1, J-2 (solder 1) to Pin 4, J-2.

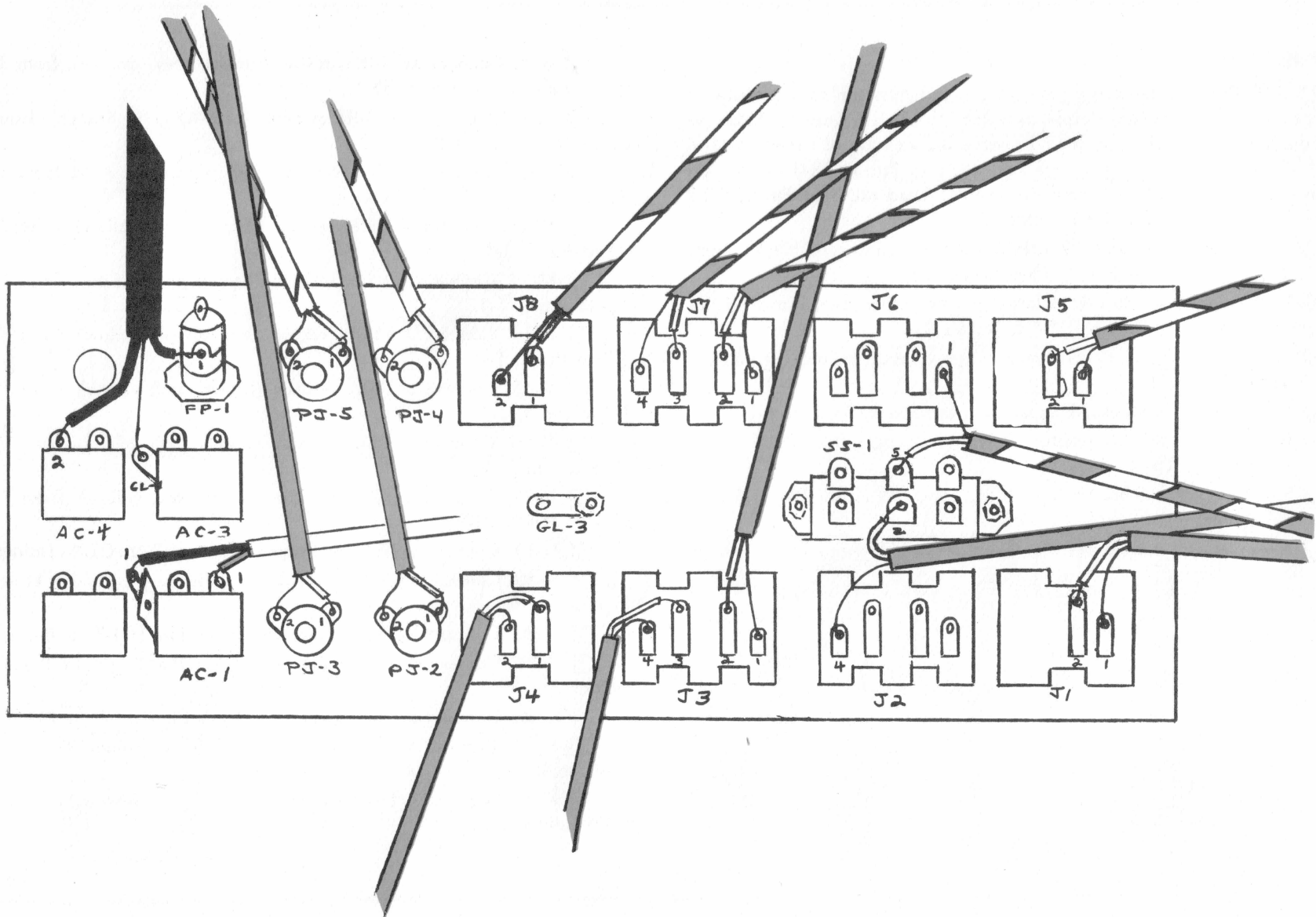
K-20. Connect a 1 $\frac{3}{4}$ " black wire from Pin 1, J-3 to Pin 4, J-3.

K-21. Connect a 1 $\frac{3}{4}$ " black wire from Pin 1, J-6 to Pin 4, J-6 (solder 2).

K-22. Connect a 1 $\frac{3}{4}$ " black wire from Pin 1, J-7 to Pin 4, J-7.

K-23. Connect a bus wire from Pin 2, J2 (solder 2) to Pin 1, SS-2 (solder 1).

K-24. Connect a bus wire from Pin 2, J-6 (solder 1) to Pin 4, SS-2 (solder 1).



Drawing L

STEP L

This is the final electrical step of the kit assembly. You will mostly be connecting the remaining unconnected ends of the various cables to the input and output jacks on the rear. In almost every case there will be both an insulated wire and a bare wire to be connected. To save constant repetition we have used a shortened version of L-1 in all the steps that follow it. Use spaghetti whenever necessary to avoid short circuits.

When connecting to the terminal pins on J-1 through J-8, use the hole furthest from the rear. A phono plug will be inserted in this jack when it is in use, and if you use the hole closer to the chassis, the solder may interfere with the plug.

- L-1. Connect the insulated wire at the unconnected end of Cable 1 to Pin 1, PJ-5 (solder 2). Connect the bare wire to Pin 2, PJ-5 (solder 2).
- L-2. Insulated wire on Cable 4 to Pin 1, PJ-3 (solder 2). Bare wire to Pin 2, PJ-3 (solder 2).
- L-3. Insulated wire on Cable 9 to Pin 1, PJ-4 (solder 1). Bare wire to Pin 2, PJ-4 (solder 1).
- L-4. Insulated wire on Cable 10 to Pin 1, PJ-2 (solder 1). Bare wire to pin 2, PJ-2 (solder 1).
- L-5. Insulated wire on Cable 12 to Pin 5, SS-1 (solder 2). Bare wire to Pin 1, J-6 (solder 2).
- L-6. Insulated wire on Cable 13 to Pin 2, J-5 (solder 1). Bare wire to Pin 1, J5 (solder 1).
- L-7. Insulated wire on on Cable 15 to Pin 2, J1 (solder 1). Bare wire to Pin 1, J1 (solder 1).
- L-8. Insulated wire on Cable 16 to Pin 2, SS-1 (solder 2). Bare wire to Pin 4, J2 (solder 3).
- L-9. Insulated wire on Cable 17 to Pin 2, J7 (solder 2). Bare wire to Pin 1, J7 (solder 3).
- L-10. Insulated wire on Cable 18 to Pin 3, J7 (solder 2). Bare wire to Pin 4, J7 (solder 4).

- L-11. Insulated wire on Cable 19 to Pin 2, J3 ((solder 2). Bare wire to Pin 1, J3 (solder 3).
- L-12. Insulated wire on Cable 20 to Pin 3, J3 (solder 2). Bare wire to Pin 4, J3 (solder 4).
- L-13. Insulated wire on Cable 31 to Pin 1, J4 (solder 1) and the bare wire to Pin 2, J4 (solder 1).
- L-14. Insulated wire on Cable 32 to Pin 1, J8 (solder 1) and the bare wire to Pin 2 (solder 1).
- L-15. Locate the large black shield with the two heavy black wires inside. Unwrap 1½" of shield from unconnected end. Be careful that the bare wire from the shield does not touch the chassis. Connect the bare wire to GL-1 (solder 3). Connect one of the black wires to Pin 1, FP1 (solder 2) and the other to Pin 2, AC-4 (solder 3).
- L-16. Clip off the bare wire at the unconnected end of Cable 37. Connect the red insulated wire to Pin 1, AC-1 (solder 2) and the black insulated wire to Pin 1, TS-8 (solder 2).

FINAL ELECTRICAL INSPECTION

You have now completed the electrical assembly. Before proceeding it is essential that you carefully go over your work looking for short circuits or cold solder joints. Take a small screwdriver and slowly check every connection on the pushbutton assembly. Move pins apart if you suspect near-shorts. Move all the wires to make sure they are not accidentally contacting a nearby pin. When you finish with the pushbutton assembly, repeat this inspection with the two Board Jacks, BJ-1 and BJ-2. Then go over all the switches, jacks, and terminal strips. If you are satisfied, begin the dressing procedure.

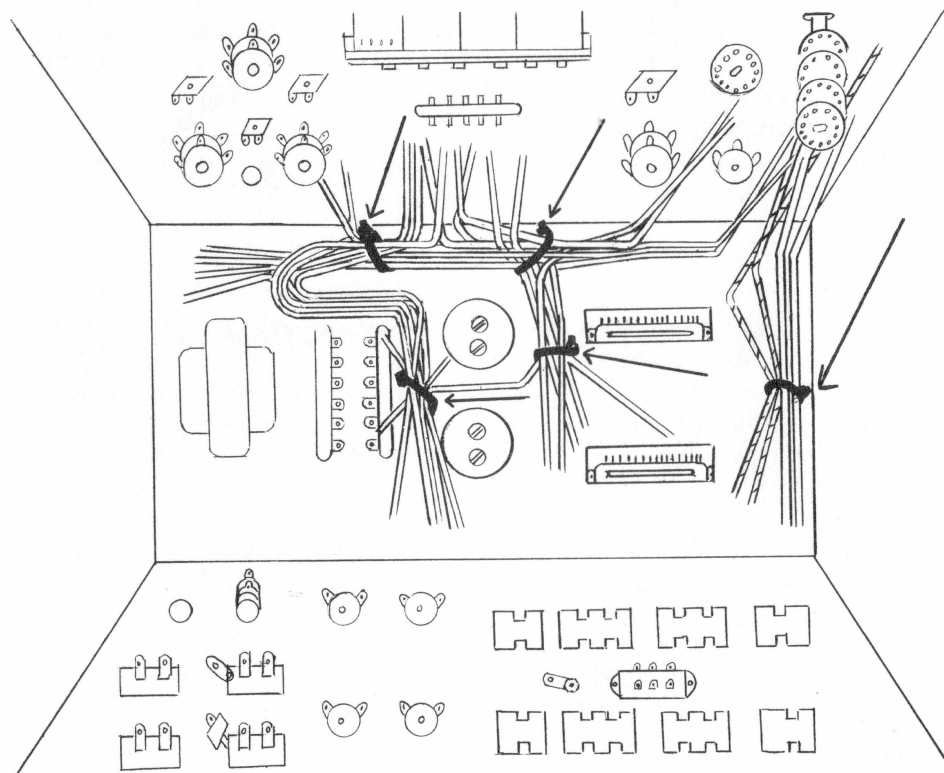


Fig. 13

Look at Fig. 13. Using the special tie-wraps found in envelope 16, tie together those cables that are near each other as in the illustration. Use of the tie-wraps is depicted in Fig. 14. Press the tied cables so they are close to the chassis and give a neat appearance. If you really want to dress the unit up, you may use string when you run out of tie-wraps. Some people even square off the hook-up wires. A little attention and time at this stage will give you a unit that you can be proud to show people as well as listen to.

In dressing the wires, make sure there are none blocking the openings in the various phone and phono jacks. When plugs are inserted in these openings later, you won't want any wires or components to interfere.

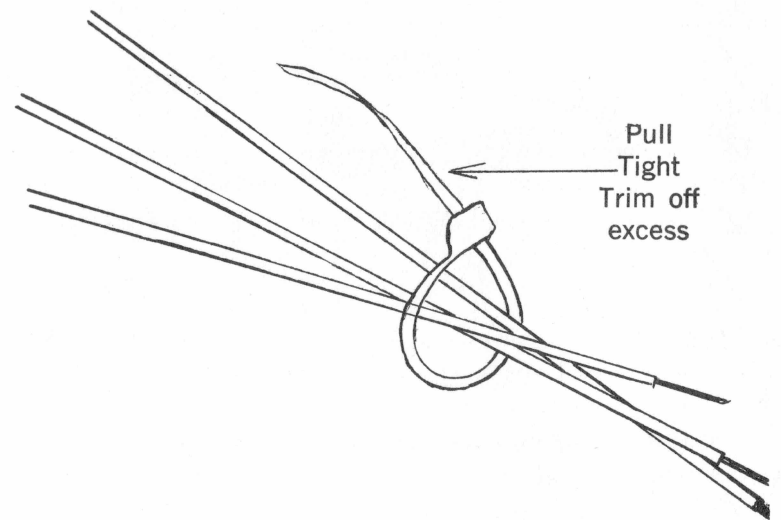


Fig. 14

FINAL MECHANICAL ASSEMBLY

1. Plug the two identical circuit boards in to the Board Jacks. The boards have been assembled, soldered, and tested at the factory. They have also been individually measured and adjusted for lowest distortion by test technicians. A typical control center will have less than 0.15% IM or harmonic distortion in both channels whether measured through the tuner or magnetic inputs. Do not remove or change the transistors as this will affect performance.

To insert the boards, place the contact end into the lip of either BJ-1 or BJ-2, making sure the side of the board with the components is facing towards the front of the control center. Now with the palm of your hand, firmly press down until the board seats itself tightly into the board jack. A little pressure is required.

2. Unscrew the cap of the fuse post, FP-1, by turning the cap counter-clockwise. Insert the fuse from envelope 16 into the cap. Then push the fuse into the spring loaded fuse post, pushing firmly forward and turning slowly clockwise at the same time. As soon as you find the groove, the fuse and cap will drop into place, and another short clockwise turn on the cap will lock it.

3. Take the front panel and place it over the controls on the front of the control center. Due to production tolerances it may in some cases take a little pressure to get the panel to fit snugly against the front chassis. In extremely difficult cases, you will find that loosening the hex nuts that hold down the various controls just the least little bit, will make it easier to get the panel on. Once the panel is on, take $\frac{3}{8}$ " hex nuts and thread them on loosely to the various controls as shown in Drawing M. Once all the hex nuts are on, you may then tighten them down securely.

4. Mount the knobs (from envelope 16) as shown in Drawing M. The knobs on the Input Selector and the Level Control are dummy dual concentrics. The knobs for the Mode Selector and the Balance control are singles but with a large diameter mounting hole. There are two knobs that go on to each set of Frequency Compensation controls. The large, flat knob goes on first. Position it as close to the panel as possible. Then over this goes a standard knob only this one has a small diameter hole. Once the dual knobs are mounted make sure you can turn one without its af-

fecting the position of the other. If they interact, readjust their position so this does not occur.

The knobs have indicator lines on their sides. These indicator lines must be pointing to the correct places on the front panel when in use. The Input Selector and Mode Selector switches have flats on the control shafts, so it is easy to slide the knobs on correctly. The set screw should be tightened into the flat side of the shaft. All other controls have round shafts, so the following procedure should be followed:

A. Rotate all the remaining controls to their maximum counter clockwise position.

B. Slide the knobs on the shafts so the indicator line is pointing to seven o'clock (if you visualize the face of a clock around the shaft). Tighten the set screws.

C. Rotate the controls to their maximum clockwise position. The indicator should now be approximately in the five o'clock position.

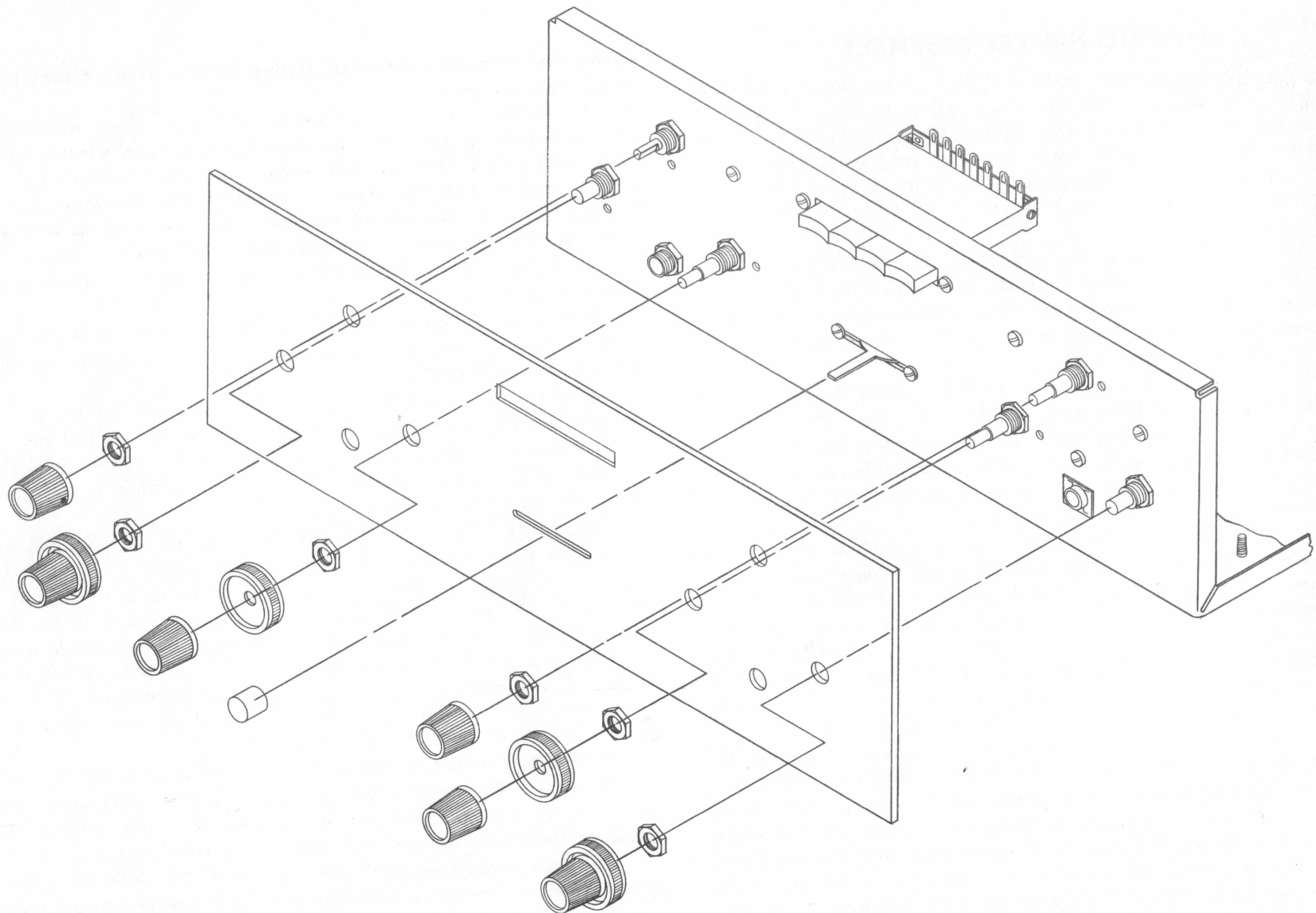
D. The maximum clockwise position and maximum counter clockwise positions should be equal distant from the center position. If they are not, loosen the set screw and adjust so they are.

The Speaker switch in the center of the panel takes a small round pushbutton knob, which is easily slid on to the shaft.

5. Before placing the protective cage over the unit, it would be well to connect the control center as per the operating instructions that follow and check it out. Remember, there are some high voltages inside the unit so do not put your hands inside when the unit is on, unless you have had a good deal of experience in servicing or testing instruments. If the unit works properly go on to step 6. If it doesn't, don't panic. Turn to the section on "What to do if it doesn't work!".

6. If all is well, take the cover and place it over the top of the control center. The cover is held on by the 6 x $\frac{1}{4}$ sheet metal screws found in envelope 16. Don't be afraid to apply a little pressure when installing these sheet metal screws. They are supposed to make a tight fit.

You have now completed your Acoustech IV Solid State Stereo Control Center. You can look forward to years of trouble-free performance and the best in sound reproduction. Make sure you read the operating instructions carefully and follow them explicitly.



Drawing M

OPERATING INSTRUCTIONS

It has been our object to make the Acoustech IV the most perfect and reliable stereo control center possible at the present stage of the art. No effort or expense has been spared in assuring optimum performance in the two main functions of a control center: (1) to preamplify the very weak signals coming from magnetic sources like phono cartridges and tape heads; (2) offer the ultimate in precise, flexible controls.

The solid state circuitry of the Acoustech IV offers a combination of low distortion, superb transient response, high signal to noise ratio, and an ability to handle overloads rarely if ever accomplished in any similar instrument. An additional benefit of the solid state complement is the rapid "warmup." The Acoustech IV starts to reproduce sound within 2 seconds of depressing the power switch.

With all its flexibility, the Acoustech IV is simple to operate. Most controls are designed to be set once and changed infrequently. Even the level control can be preset to a normal position and left that way if desired. If a momentary reduction in sound is required (to answer the phone, or to eliminate unpleasant noises resulting from rewinding tape or changing records manually), a simple push on the Muting Switch will accomplish this instantly. When volume is to be restored to its original level, push the Muting Switch a second time.

A glance at the back panel of your Control Center illustrates another example of the no-compromise approach. The Acoustech IV uses heavy-duty output phone jacks which make positive contacts at all times and do not introduce noise. The difference in style between the input and output jacks makes it impossible to confuse one with the other. The clear anodized instrument finish resists scratching and tarnishing.

These are just a few examples of the unremitting care and skill that have gone into the design and production of your new Control Center. This instrument is capable of years of matchless listening pleasure. However, to maximize the satisfaction you can get, read the instructions completely and carefully. It will repay you many times over.

INSTALLATION

The Acoustech IV can be placed on bookshelves, room dividers, or other furniture. An accessory walnut case is available.

CUSTOM INSTALLATION

All Acoustech instruments are designed for easy custom mounting in cabinets or walls. An accessory molding is available from your dealer or the factory to provide a beautiful frame for the front panel in custom installations. The templates enclosed with the unit contain instructions for custom mounting.

VENTILATION

The power consumption of the Acoustech is under 8 watts, about the same as a small night light. While insignificant, some space should be left on top of the Acoustech IV so that air can circulate. When custom mounting the Acoustech IV with *any* other component, even an Acoustech solid state stereo power amplifier, *always* mount the Acoustech IV *beneath* the other components. In this way, undesirable rises in ambient temperatures can be avoided. If you are using a tube tuner, it is particularly important that the tuner be above all the solid state components. Compared to *vacuum tube* power amplifiers, vacuum tube tuners are cool but, compared to Acoustech solid state instruments, tube tuners are very warm.

CONNECTIONS

AC POWER

Plug the cord into any standard 117 volt AC outlet.

The Acoustech IV can be modified for 220-250 volt operation common overseas. See appendix.

Four accessory AC outlets are provided on the rear of the Acoustech IV. Connect your power amplifier and tuner to the switched outlets, and turntable and tape recorder to the unswitched outlets. The switched outlets are not operative unless the Acoustech IV is on, while the unswitched outlets are operative so long as the AC power cord of the Acoustech IV is plugged into an AC outlet.

LOW-LEVEL INPUTS

A low level device is one whose output is measured in terms of a few millivolts. A magnetic phono cartridge is such a device. Another is a tape deck. (A tape deck differs from a conventional tape recorder in that its output comes directly from the tape head to the Acoustech IV, without receiving any additional amplification. If you have a standard tape recorder which includes playback preamplifiers, refer to the section on Tape Recorder Input.)

All of these require additional amplification in order to be reproduced properly. The Acoustech IV includes 3 sets of low-level inputs which will handle two different low-level sources at one time (Mag. 2 Hi and Lo cannot both be used at the same time). They only differ in the amount of amplification they provide. It is important to use the input that most closely matches the output of your cartridge or other device. This is to insure that you will always be operating at the lowest distortion level.

The output of your cartridge in millivolts (measured at a velocity of 5 cm/sec.) is usually given in the literature accompanying it, or this information can be obtained from your dealer. If this information is specified at a velocity other than 5 cm/sec., the simple ratio given below* will convert this to the proper figure (for example, if the output is given at a velocity of 10 cm/sec. then divide the output figure in half to get the value at 5 cm/sec.).

Use the following table as a guide for the correct input to use for low-level sources:

Mag 1 — any cartridge (or tape deck) with an output of 2.5 to 9 mv.

Mag 2 Lo — any cartridge (or tape deck) with an output of 2.5 to 9 mv.

Mag 2 Hi — any cartridge with an output of 10 mv up.

NOTE: Mag 2 Lo and Mag 2 Hi cannot be used at the same time — use one or the other. Slide the switch on the back to the inputs actually being used.

HIGH-LEVEL INPUTS

Tuner — This input should be used with any tuner — FM, FM/AM, or FM multiplex stereo. If the tuner has a level control, set it so that the volume of sound does not vary significantly when switching between the Mag inputs and Tuner. The input sensitivity of the high-level inputs on the Acoustech IV is about 0.5 volts.

Auxiliary — This input can be used for any high output source such as TV sound, a second tuner or tape recorder, crystal or ceramic cartridge, or microphone. See item above on tuners for comments concerning input sensitivity.

*5 x given output = output for 5 cm/sec. given velocity.

TAPE RECORDER INPUT

A special set of inputs is provided for tape playback. These inputs are not affected by the Input Switch at all but are controlled by the Tape pushbutton on the front panel. When this switch is engaged you will not hear any other signal source regardless of the setting of the Input Selector. This switch should only be used when you want to play back tape. This switch can also be used to monitor a recording in process. More details on this in the section on the Tape Switch.

Connections to the Tape recorder inputs are identical to those outlined for tuner above. If you have a tape deck ((without playback preamplifiers) rather than a tape recorder, follow instructions under Low-Level Inputs.

MONOPHONIC SOURCES

In case you are using a monophonic source, there will be only one cable to connect to the Acoustech IV. Plug this one cable into the appropriate left input and set the mode switch on the front panel to "Left Input" so that you will hear the monophonic material over both your speakers.

CHASSIS GROUND

Many record players or tape decks require grounding to the control center in order to reduce hum to unobjectionable levels. A convenient grounding lug is provided on the back of the Acoustech IV. Simply loosen the knurled outer nut. Wrap the grounding wire (or place the spade lug, if one is used) around the threaded screw. Then tighten down securely with the knurled nut.

OUTPUTS

AUDIO OUTPUTS

As explained in the introduction, the output phone jacks used by Acoustech provide superior performance and reliability. Supplied with your Acoustech IV are two six-foot cables with phone plugs on each end which can be used to connect the main outputs of the Acoustech IV to any Acoustech solid state stereo power amplifier. One of the advantages of the Acoustech IV's solid state circuitry is that the separation from the Acoustech IV to any power amplifier is not too critical. Shielded connecting cable should always be used. Avoid lengths over 50 feet.

TAPE OUTPUT

The tape outputs permit you to supply to your tape recorder the same signal you hear over your speaker system. The tape outputs are affected only by the Input and Mode Selectors on the front panel of the Acoustech IV. No more than 10 feet should separate the Acoustech IV from your tape recorder.

If you desire to take advantage of the professional operating features on your Acoustech IV for more meticulous control of the recording, you can use the Headphone output on the front panel. The level and tone controls, for example, are fully operative on these outputs.

FRONT PANEL STEREO HEADPHONE OUTPUT

This output provides a signal identical to the ones coming from the audio outputs on the rear of the Acoustech IV. With high impedance headphones, a matching transformer is not required. For low impedance phones it is essential that one be used. This output can also be used for connecting to a tape recorder. All front panel controls affect the headphone output.

OPERATING CONTROLS

POWER — This pushbutton turns on the control center, as well as supplying power to any devices connected to the switched accessory outlets on the back panel. To turn off unit, press the pushbutton a second time. Because of solid state circuitry, the Acoustech IV will begin to reproduce sound within seconds of activating this switch.

LEVEL — The level control varies the loudness of the system. Clockwise rotation increases the volume.

Once the volume is set to suit your taste, it will probably not have to be varied significantly. If you need to turn the level down quickly then simply use the Muting Switch described below.

MUTING — If you wish to momentarily reduce the level of sound, to answer the door or the phone, rewind tape, or manually change a record, then simply push the Muting Switch. This will produce about a 15 db drop in volume. You will still have audible sound but it will be quite unobtrusive. When you are ready to restore the volume to its original level, press the Muting Switch a second time. This useful switch allows you to reduce the volume without turning any controls.

INPUT — This switch selects the various inputs on the rear panel. By turning the switch to the Mag, Tuner, or Aux. positions, you can select one of the devices connected to the control center. Refer to the section on Connections to insure the proper choice of inputs.

MODE — This versatile switch controls the mode of operation of the control center. The description of each position follows:

MONO — If you play monophonic records with a stereo cartridge, it is advisable to eliminate signal resulting from vertical motion of the stylus. Such vertical motion is reproduced as rumble and can be quite

annoying on many monophonic records. The MONO position will prevent reproduction of these vertical signals.

REV STEREO — Is the same as stereo, below, except that the right inputs now feed the left outputs and vice versa. This is a simple way to move the instruments of the orchestra from one side to the other if you wish.

STEREO — The normal position of the control center. Use this for all stereophonic program material.

LEFT INPUT — Any devices connected to the left inputs will be fed to both left and right outputs. This feature is useful for monophonic sources.

RIGHT INPUT — Any devices connected to the right inputs will be fed to both left and right outputs.

SPEAKER SWITCH

In the left position only, the left speaker receives any signal, while in the right position it is just the right speaker. For normal operation when both speakers are desired, leave in the Both position. This control permits you to listen to only one speaker without having to alter your Stereo Balance setting. It is also important in the Balancing procedure described below.

STEREO BALANCE

When this control is turned counterclockwise it decreases the volume of sound emanating from your right speaker and thus makes the left channel more prominent. Turning the control clockwise makes the right speaker more prominent. In the extreme positions only one speaker will be audible.

For optimum enjoyment of any program material, the level of sound from right and left channel speaker systems should be balanced. Acoustech makes it very easy to balance your system perfectly.

To balance amplifier and speakers only: Set the Mode to Left Input, and either tune in a broadcast or play a record. Move Speaker Switch to Left, and then to right. Adjust the Stereo Balance so that the sound is equal as heard over your two speaker systems. While making the comparison tests, stay in your usual listening areas. You may want someone else to move the speaker switch for you.

It is not unusual for the normal location of the stereo balance to be off center. Room acoustics, differences in speaker efficiencies, location of the listening area — all conspire to create imbalances in sound between the two speakers. This is quite normal.

To balance the entire sound system from program source through the speaker: In most cases, the balancing system outlined above should be satisfactory. However, you may occasionally have reason to suspect your stereo tuner, cartridge, or the original program insofar as channel balance is concerned. To check this, set the Mode Switch to Stereo and repeat the procedure above. Your complete music system will now be in balance including the program source. Of course, the stereo balance will have to be varied slightly as you change the source material. This method is only recommended when you have a cartridge or tuner that is significantly out of balance.

TAPE

To play back tapes on a complete tape recorder, press this pushbutton and you will instantly bypass the Input switch and be set to hear tapes only. Release this switch as soon as you are finished with the tape recorder.

If your tape recorder has a separate record and playback head, you may use this switch to monitor a tape recording while in process. With the tape switch out, you will be listening to the source material as it goes to the recorder. With the tape switch in, you will be listening to the recording a fraction of a second after it has been made. By repeated use of the tape switch you can tell if the tape recording is equivalent in quality to the original source material.

This switch will only work as described if you are using a recorder with separate record and playback heads.

FREQUENCY COMPENSATION

Acoustech has designed a unique frequency control network which can be introduced any time desired by engaging the Push button designated "Comp." *Unless this button is depressed, the frequency compensation controls are not operative.* Acoustech does not recommend indiscriminate use of these controls. Optimum transient response and the most faithful reproduction of quality music sources will occur when the system is operated without any frequency compensation. However, there may be cases when it is either necessary or desirable to deviate from a flat frequency response. The action of the frequency compensating circuit has been designed by Acoustech engineers to satisfy audibly rather than to meet any preconceived ideas. Below you will find explanations on how to use these versatile controls.

FILTERS — For removing excessive high frequency noise such as on old records, poor AM broadcasts, tape hiss, etc., turn both Right and Left high frequency controls to the "F" position. Press the "Comp." button. The high frequency controls are the smaller controls in the front. If the noise is extremely objectionable, turn the controls beyond the "F" point to maximum counterclockwise. Naturally, most of the high frequencies in the music will be eliminated as well.

For removing severe low frequency noises such as turntable rumble, hum, and other motor noises, turn both Right and Left low frequency controls (the larger knobs behind) to the "F" position. Press the "Comp." switch. Leave the High Freq. controls in the normal "N" position. This will of course remove some of the bass notes as well.

LOUDNESS — A failing of the human ear is its inability to hear the extreme low frequencies as clearly when the volume of sound is severely reduced. To compensate for this, rotate both the Right and Left low frequency controls to the "L" position and then depress the "Comp." switch. If the level of sound is very low, in fact, barely audible, rotate the Low Freq. controls to maximum clockwise, and turn the High Freq. controls to the "L" position. Once you turn the volume up to a normal room volume, immediately remove this network from operation by depressing the "Comp." switch a second time.

TONE CONTROLS — With equipment as fine as your Acoustech IV it is desirable to use good associated equipment and the best records or tapes available, to take full advantage of the superior sound possible with this unit. When this is done, no tone controls are necessary or desirable. However, if circumstances require some adjustment of frequency response, the High and Low Frequency Compensation controls can be used as regular tone controls. First, depress the "Comp." switch. Then adjust the controls to suit your requirements. Note that the circuit used in the Acoustech IV has no effect on the midrange, but only varies the extreme highs and lows. When using the controls you may feel that the range of operation is not as great as with conventional tone controls which affect the midrange as well. In actuality at the critical deep bass or extreme treble ranges, the controls on the Acoustech IV provide the optimum amount of variation necessary.

WHAT TO DO IF IT DOESN'T WORK!

In almost all cases of non-operation, the problem is some small mistake that resulted from being in too big a hurry to connect the unit up and listen to it. For example: Is the plug to the AC line connected? Is the fuse in properly? Are the circuit boards plugged in all the way? Have you made all connections to the amplifier, tuner, and phonograph properly? Is the Input Selector, Loudness control, Power on-off set properly?

If it is none of these, check to see if any slight sound, noise, or hum is audible. If it is, then make sure the associated equipment is operating. Are the interconnecting cables between the various components of your stereo system working?

If there is sound from one channel and not the other the speaker switch or balance control may not be in the proper position.

If it is none of these obvious faults, then you should disconnect the control center and carefully check your assembly with the instructions or have a friend do it for you. While doing this, watch for short circuits or miswires. If you have access to a VTVM, the enclosed schematic will guide you to the troublesome area. The control center is easy to trouble-shoot in the hands of an experienced service or test technician. Remember the circuit boards have been carefully tested at the factory so it is extremely unlikely that any difficulty will result from board problems.

ACOUSTECH KIT SERVICE POLICY

If all else fails, Acoustech has provided a special kit service program to remedy the difficulty. At convenient points around the country there are established authorized service depots. A list of these organizations is included with the kit or can be obtained from your dealer. These organizations have the parts and know-how to get your kit in perfect working order. There is an automatic \$6.00 inspection fee charged on each kit brought in. If the inspection indicates that the fault lies with workmanship there will be an additional \$6.00 charge to cover the cost of repairs plus a nominal charge for any parts that have to be replaced. If inspection indicates that some defective component has slipped by Acoustech's exhaustive inspection and that this is causing the difficulty, then you will not be charged any additional amount and the repair costs will be borne by Acoustech.

All of these charges are predicated on the assumption that you carefully followed all instruction and did not use Acid Core Solder. If you disregarded the instructions, then the Service Station is free to charge a higher fee depending on the additional rework required.

Many dealers have good service facilities. If it is more convenient to go to your dealer for service, check with him to see if he will follow the Acoustech Service policy outlined above as to charges.

If no dealer or service station is convenient, you may return the unit to the factory for service. Before shipping the unit back, write to the: Kit Service Dept. Acoustech, Inc., 139 Main St., Cambridge, Mass. 02142; and completely describe your difficulty. The trained technical experts will study your letter and may be able to give you suggestions as to correcting this problem. If this is not possible, you will be given authorization to return the unit. **DO NOT RETURN THE UNIT TO THE FACTORY WITHOUT WRITTEN PERMISSION.** Enclose with the kit a complete list of what you feel is wrong. Send under separate cover a check for \$12.00 to cover inspection and repairs. If the problem is due to a component failure, you will get a refund of \$6.00.

For shipping to the factory, do not use the original kit box. Obtain a larger cardboard carton, fill it with crumpled newspapers, and put the completely assembled kit in the middle. Pack securely, and insure for full value. Ship by Railway Express Prepaid and the unit will be returned collect. **DO NOT USE PARCEL POST OR ALL WARRANTIES ARE VOIDED.**

WARRANTY

Acoustech guarantees that all parts and materials (except fuses) will be free of defects for a period of one year from the date of purchase. Return the defective component either to an authorized service station or directly to the factory. The defective component will immediately be replaced at no charge to you. This guarantee is void if the instructions for assembling the kit have not been carefully followed or if there is evidence of acid core solder.

APPENDIX

I. 220 TO 250 VOLT OPERATION

In many parts of the world, the standard line voltage is not 117 volts found in Continental United States, but is between 220 to 250 volts. Your kit can easily be converted to operate at this higher voltage. It is designed for either 50 or 60 cycle AC sources.

Turn to Step D in the assembly instructions. Note that in steps D-4 and D-6, instructions are given regarding the red/black wire and the white wire coming from the transformer. Disregard these instructions. Instead solder the ends of these cables together, wrap the soldered ends securely with friction tape, and neatly fold the wires so that they are out of the way. All other instructions stay the same, except that there will now be one less wire connected to the fuse post and the accessory outlet. Remember this when you count the wires present preparatory to soldering.

II. CENTER CHANNEL OUTPUT

Some music listeners like to drive a third power amplifier which in turn drives a so-called center channel loudspeaker, one that sits in between the left channel and right channel loudspeaker. The signal supplied to this speaker represents the sum of the right and left channel information. This same signal could also be used to drive extension loudspeakers in other rooms of the house. Acoustech engineers have deliberately omitted this feature from the standard kit, as the presence of a center channel output tends to degrade separation between left and right channel outputs to some extent. However, for those who would like to add a center channel output to their control center, a special Center Channel kit is available for \$1.00 to cover handling, mailing, and the actual parts needed. Write to the Kit Service Dept. Acoustech, Inc., 139 Main St., Cambridge, Mass. 02142. Complete instructions are included. Remember that this center channel output will drive an additional power amplifier, it cannot be connected directly to a loudspeaker.

III. DUPLICATING TAPE FROM A TAPE DECK

If you are playing tape on a tape deck (a device without playback preamplification) then you can connect to either Mag 1 or Mag 2 Low. You will have more than enough gain to enjoy your tapes at full room level. The equalization of the control center will be within 3 db. accuracy over most of the frequency range, depending on the playback heads in the deck.

Some listeners use a tape deck in conjunction with a tape recorder to duplicate tapes. When so used, it may be desirable to match NAB equalization more closely. A special modification kit is available which will convert the Mag 2 Low input to a very closely matched NAB equalization for either the Sony or Viking tape decks. In making the modification, there will be some loss of gain on this input, but there will still be more than enough signal to drive any tape recorder. Remember, this conversion is not recommended if you are merely going to listen to the tapes on a tape deck. Only add it for duplicating tapes.

When writing the factory requesting the NAB equalization kit, specify the make and model of your tape playback deck. Enclose your check (or money order) for \$1.00 to cover the cost of parts, handling, full instructions, and mailing.

ACOUSTECH IV PARTS LIST

BAG #1	4 Double phono jacks (J2, J3, J6, J7)	BAG #10	2 Capacitor mounting brackets
	4 Single phono jacks (J1, J4, J5, J8)		1 600 x 75 Capacitor (C-2)
	8 Phono jack insulators		1 800 x 50 Capacitor (C-1)
	1 Slide switch (SS-1)		2 Terminal strips (TS-6, TS-7)
	4 Phone jacks (PJ-2, PJ-3, PJ-4, PJ-5)		4 Capacitor lugs
	1 Knurled thumb nut		1 Grounding lug (GL-3)
BAG #2	18 6-32 x 3/8 machine screw	BAG #11	Solder
	5 #6 lockwasher	BAG #12	Bus wire
	29 6-32 x 1/4 machine screw		Hook-up wire
	1 6-32 x 3/8 machine screw		Insulation (spaghetti)
	4 6-32 x 7/8 machine screw	BAG #13	1 Input selector switch (SWR-94)
	49 6-32 x 1/4 hex nut		(S-1)
BAG #3	4 3/8 lockwashers		1 Pushbutton switch (PB-1)
	4 3/8 machine washers		1 Terminal strip (TS-5)
	17 3/8 x 1/2 machine hex nuts	BAG #14	2 1/2 watt 100K resistor
BAG #4	1 fuse post (FP-1)		2 1/2 watt 5.6K resistor
	1 fuse post hex nut		8 1/2 watt 18K resistor
	1 fuse post rubber washer		4 1/2 watt 4.7K resistor
	2 terminal lugs (GL-1, GL-2)		2 1/2 watt 27K resistor
	1 terminal strip (TS-8)		2 1/2 watt 12K resistor
	5 accessory outlets (AC-1, AC-2)		1 1/2 watt 82K resistor
	AC-3, AC-4)		8 1/2 watt 120K resistor
BAG #5	1 Amber pilot light (PL-1)		1 1/2 watt 820K resistor
	2 Pilot light clips		2 1/2 watt 6.8K resistor
BAG #6	1 RCVD 10K (VR-1)		1 2 watt 680 ohm resistor
	2 RCVC 50K (VR-2, VR-4)		1 2 watt 82 ohm resistor
	1 RCVD 250K (VR-3)	BAG #15	4 CPM-1 capacitor
	1 Phone jack (PJ-1)		2 CMS-3900 capacitor
BAG #7	1 Mode switch (SWR-45) (S-2)		1 RB-2 Rectifier
	1 Lever switch (S-3)		3 CD-01M capacitor
	2 6-32 x 1/4 brass machine screws	BAG #16	5 Cable ties
	4 Terminal strips (TS-1, TS-2,		Fuse (MDL 1/16)
	TS-3, TS-4)		Knobs
BAG #8	4 Rubber feet		1 Small screwdriver
	4 1032 x 1/2 screws		16 6 x 1/4 sheet metal screws
BAG #9	2 Board jacks (BJ-1, BJ-2)	PARTS NOT IN BAGS	1 Transformer
	2 Fishpaper strips		1 Bag of cables
			1 Chassis
			1 Front panel
			1 Cover